



# Why electronic voting in the Ontario election is a mistake

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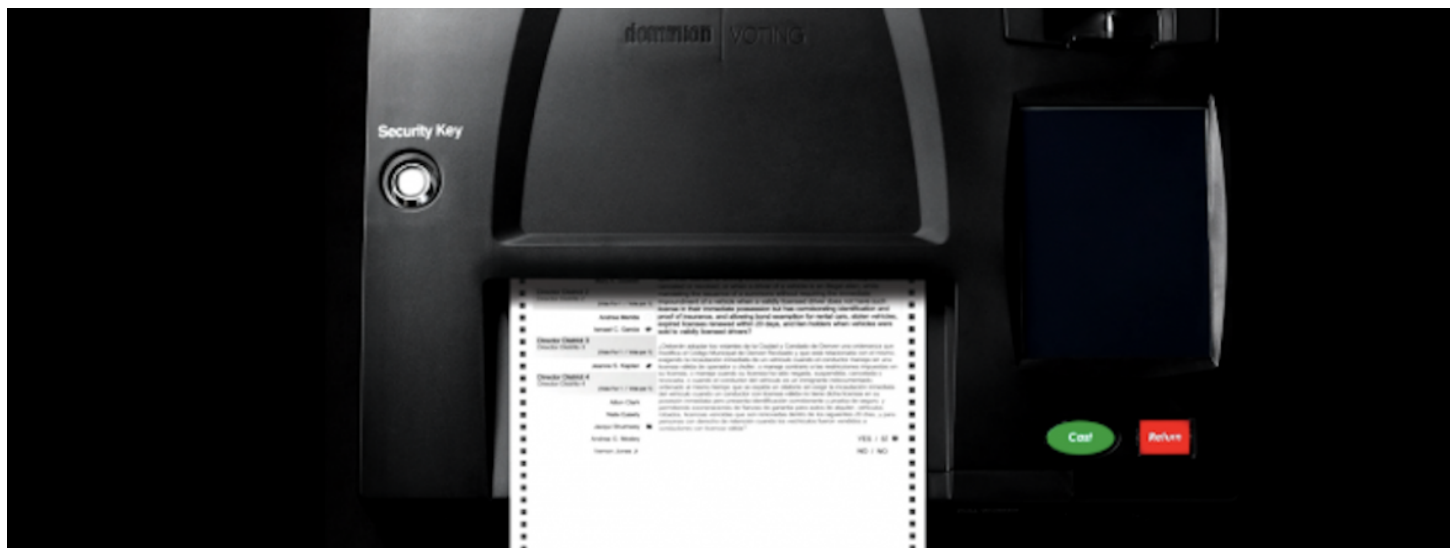
June 4, 2018

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A seismic shift will occur in Ontario politics on June 7 regardless of which party wins the election: electronic vote-counting machines **will be used across the province for the first time** (<https://www.thestar.com/news/canada/2018/05/09/ontario-using-electronic-voting-machines-voters-lists-in-june-7-election.html>).

**Machines** (<https://www.verifiedvoting.org/resources/voting-equipment/dominion/imagecast/>) will scan voters' paper ballots and calculate the totals at each polling station that is equipped with them. Ninety per cent of the ballots will be counted this way. The rest will be counted by hand, as not all polling stations will have machines. When the polls close, offsite computers will add up the votes.

On June 1, **CBC News reported** (<http://www.cbc.ca/news/canada/toronto/pc-concerns-ontario-voting-machines-1.4686946>) that the Progressive Conservatives, "wrote to Elections Ontario this week to flag several issues, including concerns about protection from hacking and the certification of the vote-counting machines." Elections Ontario's chief administrative officer, Deborah Danis, was quoted as responding, "There is no possibility that the counts could not be fully corroborated. I would actually argue that the introduction of technology increases our accuracy."

Unfortunately, this response from Elections Ontario falls far short. Here's why.

The major problem with the plan is that scrutineers, appointed by parties to watch for cheating, will no longer be able to observe the count for 90 per cent of the ballots. Nor will they be **permitted** (<https://www.elections.on.ca/content/dam/NGW/sitecontent/2017/politicalentities/Scrutineer's%20Guide.pdf>) **to object**

(<https://www.ola.org/en/legislative-business/bills/parliament-41/session-2/bill-45/status-of-business>) in 2016 -- even though it is just as consequential as past proposals that warranted a **referendum** ([https://en.wikipedia.org/wiki/Ontario\\_electoral\\_reform\\_referendum,\\_2007](https://en.wikipedia.org/wiki/Ontario_electoral_reform_referendum,_2007)).

Elections Ontario is framing this as a **change for the better** (<https://www.elections.on.ca/content/dam/NGW/sitecontent/2017/resources/Annual%20Report%202015-2016.pdf>) by speeding up ballot counting and reducing the number of polling station staff, which they say are hard to find. In a **test of electronic voting** (<https://www.elections.on.ca/content/dam/NGW/sitecontent/2016/2016-whitby-oshawa-by-election-report/Post%20Event%20Report%20-%20Proposal%20for%20a%20technology-enabled%20staffing%20model%20for%20Ontario%20Provincial%20Elections.pdf>) in a 2016 by-election, the agency found e-counting ballots took only half an hour, compared with 90 minutes, for hand-counting.

The convenience and cost savings have led Ontario municipalities to use tabulators in their elections for years, but it is far from clear whether their counts were ever accurate.

One source of doubt is how the devices are tested by the cities. On **the City of Toronto's elections website** (<https://www.toronto.ca/city-government/elections/>), for example, there is only one document about tabulator testing. It says they run sample ballots through the tabulators and if the counts are correct they assume the machines will function correctly on election day.

Unfortunately, as **Volkswagen car owners found out** ([https://en.wikipedia.org/wiki/Volkswagen\\_emissions\\_scandal](https://en.wikipedia.org/wiki/Volkswagen_emissions_scandal)), this is not a good way to test computerized devices. The company illegally programmed their emissions-control devices to behave correctly on test day, but spew 40 times more nitrous emissions in real-world driving. This proved to be a \$15-billion boondoggle for Volkswagen: the largest settlement of an automobile-related consumer class-action lawsuit in American history.

Another good reason to distrust these devices is a **June 2017 report** (<https://www.cse-cst.gc.ca/en/democratic-process-processus-democratique/page2>) from Canada's Communications Security Establishment, warning that cyber threats to elections are growing worldwide. The report concluded "the trends we identify... are likely to act as a tailwind, putting some of Canada's provincial/territorial and municipal political parties and politicians, electoral activities and relevant media under increasing threat."

Traditional checks and balances within the Election Act would normally have protected our system from these hazards, but the government has found a way around them.

**T** (<https://www.ontario.ca/laws/statute/90e06#BK154>) **he Act** (<https://www.ontario.ca/laws/statute/90e06#BK154>) **clearly** (<https://www.ontario.ca/laws/statute/90e06#BK154>) **states** (<https://www.ontario.ca/laws/statute/90e06#BK154>): “the deputy returning officers shall open the ballot box and proceed to count the number of valid ballots cast for each candidate and all other ballots, therein giving full opportunity to those present to see each ballot and observe the procedure.” Outsourcing the count to computer stakes away this opportunity.

To cover itself, the government added **a new section to** (<https://www.ontario.ca/laws/statute/90e06#BK16>) **t** (<https://www.ontario.ca/laws/statute/90e06#BK16>) **he** (<https://www.ontario.ca/laws/statute/90e06#BK16>) **Act** (<https://www.ontario.ca/laws/statute/90e06#BK16>) in 2016 that empowers the Chief Electoral Officer to impose the use of electronic vote-counting equipment, and modify the voting process, even in ways that conflict with the rest of the Act.

This new power removes two key protections in the Act. First, the ability of scrutineers to observe the counting process in the open provides public accountability at each polling station. Second, putting scrutineers in every polling station means that an impossibly large number of people would have to be corrupted to significantly distort the count.

By largely eliminating independent, direct observation of ballot counting, the government is creating unprecedented opportunities for interference. For example, participants at a **major h** (<https://www.cnet.com/news/defcon-hackers-find-its-very-easy-to-break-voting-machines/>) **acking** (<https://www.cnet.com/news/defcon-hackers-find-its-very-easy-to-break-voting-machines/>) **c** (<https://www.cnet.com/news/defcon-hackers-find-its-very-easy-to-break-voting-machines/>) **onference** (<https://www.cnet.com/news/defcon-hackers-find-its-very-easy-to-break-voting-machines/>) **last year** (<https://www.cnet.com/news/defcon-hackers-find-its-very-easy-to-break-voting-machines/>) found ways to manipulate electronic voting machines in mere hours. Other methods of compromising e-voting systems have been repeatedly laid out in both the **popular** (<https://www.nytimes.com/2018/02/21/magazine/the-myth-of-the-hacker-proof-voting-machine.html>) **press** (<https://www.nytimes.com/2018/02/21/magazine/the-myth-of-the-hacker->

Ontario's Chief Electoral Officer has attempted to deflect these concerns by telling us that their **security contractors have tested** (<https://www.guelphmercury.com/news-story/8345292-ontario-s-voting-system-secure-chief-election-official-says/>). the equipment.

Both the Liberals and the NDP are satisfied with the testing, according to the **June 1 CBC report** (<http://www.cbc.ca/news/canada/toronto/pc-concerns-ontario-voting-machines-1.4686946>).

An NDP spokesperson was quoted as saying the agency "has provided all the parties with detailed information about the voting process and the counting machines."

However, none of these details have been shown to the public.

Elections Ontario also is **not subject to** (<https://www.ontario.ca/page/directory-institutions>) freedom of information requests. Therefore, the public has no way of knowing how important issues have been addressed. For example: What kinds of examinations were done on the hardware and software? How were offshore-sourced components checked for hidden **devices** (<https://www.wired.com/2016/06/demonically-clever-backdoor-hides-inside-computer-chip/>) **designed to** (<https://www.wired.com/2016/06/demonically-clever-backdoor-hides-inside-computer-chip/>) **give** (<https://www.wired.com/2016/06/demonically-clever-backdoor-hides-inside-computer-chip/>) **and** (<https://www.wired.com/2016/06/demonically-clever-backdoor-hides-inside-computer-chip/>) **control** (<https://www.wired.com/2016/06/demonically-clever-backdoor-hides-inside-computer-chip/>) to bad actors? What checks will be in place on voting day to limit access to the machines' removable memory cards that record the counts?

Without answers to these questions, we have no guarantee the June 7 official election results will reflect the choices made by voters.

But we can virtually guarantee that an attack will occur. Why? The software and hardware comes from a single source: the manufacturer. This centralises our previously decentralised system, creating a **magnet for abuse** (<https://www.csoonline.com/article/3267625/security/want-to-hack-a-voting-machine-hack-the-voting-machine-vendor-first.html>). It provides an unprecedented opportunity to corrupt the entire count by controlling just one target.

Look no farther than the **2017** ([https://en.wikipedia.org/wiki/Equifax#May%E2%80%93July\\_2017\\_data\\_breach](https://en.wikipedia.org/wiki/Equifax#May%E2%80%93July_2017_data_breach)) hack of the Equifax credit-rating agency to see what happens when you centralise control over data. The

**in** (<https://www.theglobeandmail.com/news/politics/elections-ontario-warns-voters-of-privacy-breach-as-usbs-holding-personal-data-vanish/article4422723/>) **secur** (<https://www.theglobeandmail.com/news/politics/elections-ontario-warns-voters-of-privacy-breach-as-usbs-holding-personal-data-vanish/article4422723/>) **ing voter data** (<https://www.theglobeandmail.com/news/politics/elections-ontario-warns-voters-of-privacy-breach-as-usbs-holding-personal-data-vanish/article4422723/>).

Any government that is genuinely interested in election integrity would restore scrutineers' rights, or at least implement sensible checks such as **risk-limiting audits** ([https://en.wikipedia.org/wiki/Risk-limiting\\_audit](https://en.wikipedia.org/wiki/Risk-limiting_audit)).

On the same note, if the public believes election integrity is more important than convenience, we must speak up. When candidates come knocking at your door, tell them you don't trust computers to count your vote.

*Howard Pasternack is an engineer in Toronto. Rosemary Frei is an activist and journalist in Toronto.*

*Photo: Dominion Voting Systems*

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#### **More tools to help get out the vote on June 7th**

(<https://rabble.ca/toolkit/guides/more-tools-help-get-out-vote-june-7th>).

Now that the election day is near, here are some more targeted tools to help inform people you talk to and bust some of the lies.

**Dear Premier Horwath** (<https://rabble.ca/blogs/bloggers/gerry-caplans-blog/2018/05/dear-premier-horwath>).



**In the final Ontario leaders' debate, Wynne was dignified, Horwath feisty and Ford evasive** (<https://rabble.ca/multimedia/2018/05/ontario-leadership-debate-show-ford-be-short-answers-questions>).

The Ontario election is a bit more than a week away. In the last leaders' debate of the campaign, PC leader Ford still refused to give any details about his plans.

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Clara McNee • 2 years ago



KoboCall scam) and even changed the election rules to gain an advantage for the 2015 election. Sometimes people can't help themselves from cheating in some way. Bad move Ontario. Bad move.

5 ^ | v • Reply • Share ›

r

**Centre for Public Oversight** • 2 years ago • edited

Obviously, we would like to see Ontario publish its equivalent to this document from the EAC (America's Election Assistance Commission) which outlines the certification process.

<https://www.eac.gov/file.as...>

Even still, there is a lot missing from the US checks.

One obvious hole is this:

<https://www.wired.com/2016/...>

Also, there are ways unwanted firmware changes can get into outsourced subcomponents.

We don't know the extent to which Ontario's consultants checked for this.

But we have some sense of the holes in the US tests:

"Physical external and internal examination will also be performed when the equipment is easily accessible without the possibility of damage." (See page 28, Sec. 3.2 of the EAC document)

In table 1-20 (p.12), it seems like they treat the tabulator (ImageCast Precinct Optical Scanner) as a single object.

So, there's no indication of a full teardown.

What are the subcomponents? Did any nation-state actors have access to these at the factories where these subcomponents are made?

3 ^ | v • Reply • Share ›

r

**Centre for Public Oversight** • 2 years ago • edited

Here is the specific link to the Toronto pre-election test procedure:

<https://www.toronto.ca/wp-c...>

Ontario does something similar -- run sample ballots and hope the machines behave the same way on voting day.

See page 5:

<https://www.elections.on.ca...>

2 ^ | v • Reply • Share ›



of ridings), with the machines being corroboration.

2 ^ | v • Reply • Share ›

**r** **Centre for Public Oversight** → Alexander Robinson  
 • 2 years ago • edited

Some other parts of the world that have adopted electronic vote counting, now use statistical sampling to check for abuse, such as risk-limiting audits  
<https://en.wikipedia.org/wi...>

Elections Ontario needs to explain how they can claim "modernization" without applying the best, most modern practices for using these machines.

3 ^ | v • Reply • Share ›

**r** **B Albert Wayne** → Alexander Robinson • 2 years ago

I don't know why people are thinking the integrity of the entire counting process can be corrupted or influenced in any fashion. All elector ballots are retained indefinitely, and will be available should it be necessary (legally mandated?) for recounting purposes. Scrutineers can stand and watch the total ballots read, increment throughout the day, and if there is a technical glitch during the day, the tabulator ballots can be manually counted. The tabulators are NOT connected to any other hardware of any type...it's strictly a scanner that accumulates indicated markings, thus cannot be "hacked", at least from any wired or wireless intrusions.

1 ^ | v 1 • Reply • Share ›

**r** **Centre for Public Oversight** → B Albert Wayne  
 • 2 years ago

These are fair questions. There is a lot of misinformation out there about how the system works, so hopefully this will clarify things:

Retention of ballots:

Tabulators are certainly better than touchscreen systems in that manual recounts of paper ballots are still possible. Unfortunately, the threshold for getting a recount is very high. This makes large recounts at scale more theoretical rather than a genuinely functional protection. Please see my comment from yesterday on manual recounts. to see the full

paper ballot was registered by the machine for the correct candidate. By contrast, the traditional way

[see more](#)

1 ^ | v 1 • Reply • Share ›

**r** **Centre for Public Oversight** → Centre for Public Oversight • 2 years ago

For more holes in the system, please see:

<https://disq.us/url?url=htt...>

<https://disq.us/url?url=htt...>

^ | v 1 • Reply • Share ›

**r** **Mikey** • 2 years ago

Remember that electronic tabulation of votes without democratic oversight is being implemented by a government that does NOT run democratic elections.

Point One: it is fraudulent and corrupt to pretend democracy when operating an authoritarian corporate style governance. All Cons and Libs put your hand up as guilty.

Point Two: a fake democracy telling us their new electronic voting machines, wink wink, can be trusted under their watchful, fake responsible governance, is pure horse radish.

Point Three: first past the post and unaccountable governments allows these thugs to run our province, and, our country, without safeguards that allow us to kick their asses out of government and straight into jail with heavy fines.

Be very afraid. Our culture has blinded us to its deceptive, power-laden nature.

3 ^ | v 1 • Reply • Share ›

**r** **Krishna E Bera** → Mikey • 2 years ago  
death by a thousand cuts

1 ^ | v • Reply • Share ›

**r** **h pasternack** • 2 years ago

There are a lot of ideas and assumptions out there about what can trigger a manual recount.

To clarify this, let's start with what Elections Ontario tells us:

"A candidate or elector in the Electoral District may apply to a judge for a recount if they believe there has been an error in the

of the election."

<https://www.elections.on.ca...>

Note the language "if they believe there HAS BEEN an error". This is a higher threshold than, for example, "if they have reason to suspect an error" or "if they have reason to distrust the counting machines".

Adding to the difficulty of getting a manual recount, it takes time to apply, a judge has to be present at the recount, and there would likely be a cost to the candidate. The judge can also say "no".

From the Election Act:

"74 The judge shall supervise the recount of the ballots according to the rules of the count at the close of the poll by the deputy returning officer, and shall verify or correct the statements of the poll. R.S.O. 1990, c. E.6, s. 74; 1998, c. 9, s. 40."

"78 (1) The costs of the recount, including the costs of the returning officer and the election clerk, are in the discretion of the judge who may, subject to subsection (3), order by whom, to whom, and in what manner they shall be paid. R.S.O. 1990, c. E.6, s. 78 (1)."

See:

<https://www.ontario.ca/laws...>

1 ^ | v • Reply • Share ›

r

**Clara McNee** • 2 years ago

Changing the subject for a moment poor ol Doug Ford's in-laws are telling on him. Can't imagine Ontarians would want anyone in that family to have a chance at our tax dollars however those that do should just hand over their own taxes and leave the rest of ours alone. You can have him we don't want him he's too mean/nasty/sly/whatever for the rest of us.

1 ^ | v • Reply • Share ›

r

**Centre for Public Oversight** • 2 years ago

Anyone witnessing improper handling of the memory cards can complain here:

<https://www.elections.on.ca...>

In terms of what constitutes improper handling, there is some information on that for the public, but nothing definitive, nor easy for the public to make use of.



Vote Counting Equipment Seal Control Sheet (Form 1-0000) that doesn't seem to be on their website.

Absent is anything requiring witnesses to observe how the "Tabulator Deputy Returning Officer" handles the memory cards (eg. does the TDRO have an opportunity to put the card in a small handheld device at any point?). Also, how are the cards sealed in the tabulators, how tamper-evident are the seals, and who has access to the tabulators when the TDRO is on break?

1 ^ | v • Reply • Share ›

**r Krishna E Bera** → Centre for Public Oversight • 2 years ago

I hope someone leaks the Elections Ontario testing docs and specs on the machines and any supplier documents relating to them.

<https://wikileaks.org/-Leak...>

1 ^ | v • Reply • Share ›

**r Centre for Public Oversight** → Krishna E Bera  
• 2 years ago

The Globe also has a Secure Drop.  
<https://sec.theglobeandmail...>

There's also CBC's Secure Drop.  
<https://securedrop.cbc.ca/>

But I'm not sure how reliable CBC is for this because it's almost impossible to find on their website, so I imagine they're not really interested in getting anonymous leaks.

^ | v • Reply • Share ›

**r Centre for Public Oversight** → Centre for Public Oversight • 2 years ago

Correction: CBC's secure drop is right up front. Just hard to find if you start with the site map or menu.

^ | v • Reply • Share ›



Avatar

This comment was marked as spam.

**r Krishna E Bera** → Centre for Public Oversight • 2 years ago

This is all outrageous. Are you planning any action to back

How much does it cost anyway?

1 ^ | v • Reply • Share ›

**r** **Centre for Public Oversight** → Krishna E Bera  
• 2 years ago

We're still figuring out what to do next. Also, unless we come up with something really clever, we'll probably stay away from telling people what to do (besides complain to their candidates and to Elections Ontario).

The usual stuff like petitions would have to happen organically. Also, based on the requirement of 'believing there has been an error', a petition is unlikely to spur a judicial recount.

That being said, I'm not sure how much leeway Returning Officers have to count the ballots by hand for reasons other than those in their guidebooks (which, annoyingly, are not available for public viewing). Hoping to research this very question, I asked an RO if I could see the guidebook and she said no.

As for the cost of a recount, it would vary depending on a number of factors, probably including the number of ballots and the number of people who have to be involved. The cost would be determined case-by-case by the judge.

Based on the federal costs (  
<http://www.elections.ca/con...> and  
<http://www.elections.ca/con...>), I would guess that each polling station would cost maybe \$1000 to \$2000 to recount. But it is only a guess.

^ | v • Reply • Share ›

**r** **Krishna E Bera** → Centre for Public Oversight  
• 2 years ago

The criterion is faulty. No elector or candidate could ever reach the (objective) threshold of disbelief unless the results were blatantly off. We would need exit polls to start to find out, but those are unreliable due to self-selection of respondents

I agree. The threshold is unreasonably high. It is based on the old paper system and needs to be updated to account for the new risks involved in automated counting.

Ideally, the government ought to remove the machines entirely (or perhaps allow exceptions for the disabled community), but if we're stuck with machines then the law has to be updated to employ Risk-Limiting Audits that trigger a manual count when the results are outside the margin of error.

One alternative is to push for legislation that allows ROs more flexibility to hand-count at the request of scrutineers and candidates, without having to go through a judge.

Another is legislation that requires and specifies one of the better forms of risk-limiting audits. We are looking at that right now. There are new logistical problems to figure out, such as how to set up a system so that ROs who are not mathematically inclined will be able to use simplified paper look-up tables to make statistical decisions. We would not want to use software, as it brings back the original problem -- has the software been altered?

^ | v • Reply • Share ›

**r**

**h pasternack** → Centre for Public Oversight  
• 2 years ago • edited

Disqus seems to have put the original comment on this thread in limbo, so I posted it again with some edits above.

^ | v • Reply • Share ›

**r**

**Centre for Public Oversight** • 2 years ago

How to Hack an Election: An Intelligence Analysis:

"As much as we'd all like to believe such confident pronouncements, my experience in the intelligence world, where I served as Associate Director of National Intelligence, has lead me

